American Academy of Sleep Medicine

Obstructive Sleep Apnea

Obstructive sleep apnea (OSA) is a sleep-related breathing disorder that involves a decrease or complete halt in airflow despite an ongoing effort to breathe. It occurs when the muscles relax during sleep, causing soft tissue in the back of the throat to collapse and block the upper airway. This leads to partial reductions (hypopneas) and complete pauses (apneas) in breathing that last at least 10 seconds during sleep. Most pauses last between 10 and 30 seconds, but some may persist for one minute or longer. This can lead to abrupt reductions in blood oxygen saturation, with oxygen levels falling as much as 40 percent or more in severe cases.

The brain responds to the lack of oxygen by alerting the body, causing a brief arousal from sleep that restores normal breathing. This pattern can occur hundreds of times in one night. The result is a fragmented quality of sleep that often produces an excessive level of daytime sleepiness.

Most people with OSA snore loudly and frequently, with periods of silence when airflow is reduced or blocked. They then make choking, snorting or gasping sounds when their airway reopens.

A common measurement of sleep apnea is the *apnea-hypopnea index* (AHI). This is an average that represents the combined number of apneas and hypopneas that occur per hour of sleep.

Prevalence

- OSA can occur in any ager group, but prevalence increases between middle and older age.
- OSA with resulting daytime sleepiness occurs in at least four percent of men and two percent of women
- About 24 percent of men and nine percent of women have the breathing symptoms of OSA with or without daytime sleepiness.
- About 80 percent to 90 percent of adults with OSA remain undiagnosed.
- OSA occurs in about two percent of children and is most common at preschool ages.

Types

- **Mild OSA:** *AHI of 5-15*
  Involuntary sleepiness during activities that require *little* attention, such as watching TV or reading
- **Moderate OSA:** *AHI of 15-30*
  Involuntary sleepiness during activities that require *some* attention, such as meetings or presentations
- **Severe OSA:** *AHI of more than 30*

  Involuntary sleepiness during activities that require *more active* attention, such as talking or driving

Risk groups

- People who are ***overweight*** (Body Mass Index of 25 to 29.9) and ***obese*** (Body Mass Index of 30 and above)
- Men and women with ***large neck sizes***: 17 inches or more for men, 16 inches or more for women
- ***Middle-aged*** and ***older*** men, and ***post-menopausal*** women
- ***Ethnic*** minorities
- People with ***abnormalities*** of the bony and soft tissue structure of the head and neck
- Adults and children with ***Down Syndrome***
- Children with ***large tonsils*** and ***adenoids***
- Anyone who has a ***family member*** with OSA
- People with endocrine disorders such as ***Acromegaly*** and ***Hypothyroidism***
- ***Smokers***
- Those suffering from nocturnal nasal congestion due to ***abnormal morphology***, ***rhinitis*** or both.

Effects

- Fluctuating oxygen levels
- Increased heart rate
- Chronic elevation in daytime blood pressure
- Increased risk of stroke
- Higher rate of death due to heart disease
- Impaired glucose tolerance and insulin resistance
- Impaired concentration
- Mood changes
- Increased risk of being involved in a deadly motor vehicle accident
- Disturbed sleep of the bed partner

Treatments

Sleep apnea must first be diagnosed at a sleep center or lab during an overnight sleep study, or "polysomnogram." The sleep study charts vital signs such as brain waves, heart beat and breathing.

- **Continuous positive airway pressure (CPAP):**
  CPAP is the standard treatment option for moderate to severe cases of OSA and a good option for mild sleep apnea. First introduced for the treatment of sleep apnea in 1981, CPAP provides a steady stream of pressurized air to patients through a mask that they wear during sleep. This airflow keeps the airway open, preventing pauses in breathing and restoring normal oxygen levels. Newer CPAP models are small, light and virtually silent. Patients can choose from numerous mask sizes and styles to achieve a good fit. Heated humidifiers that connect to CPAP units contribute to patient comfort.

- **Oral appliances:**
  An oral appliance is an effective treatment option for people with mild to moderate OSA who either prefer it to CPAP or are unable to successfully comply with CPAP therapy. Oral appliances look much like sports mouth guards, and they help maintain an open and unobstructed airway by repositioning or stabilizing the lower jaw, tongue, soft palate or uvula. Some are designed specifically for snoring, and others are intended to treat both snoring and sleep apnea. They should always be fitted by dentists who are trained in sleep medicine.
- **Surgery:** Surgery is a treatment option for OSA when noninvasive treatments such as CPAP or oral appliances have been unsuccessful. It is most effective when there is an obvious anatomic deformity that can be corrected to alleviate the breathing problem. Otherwise, surgical options most often address the problem by reducing or removing tissue from the soft palate, uvula, tonsils, adenoids or tongue. More complex surgery may be performed to adjust craniofacial bone structures. Surgical

options may require multiple operations, and positive results may not be permanent. One of the most common surgical methods is *uvulopalatopharyngoplasty* (UPPP), which trims the size of the soft palate and may involve the removal of the tonsils and uvula. *Adenotonsillectomy*, the surgical removal of the tonsils and adenoids, is the most common treatment option for children with OSA. Other children with sleep apnea may benefit from CPAP.

- **Behavioral changes:**

  Weight loss benefits many people with sleep apnea, and changing from back-sleeping to side-sleeping may help those with mild cases of OSA.

- **Over-the-counter remedies:**
  Although some external nasal dilator strips, internal nasal dilators, and lubricant sprays may reduce snoring, there is no evidence that they help treat OSA. They may even mask the problem by muting the loud snoring that is a warning sign for sleep apnea.
- **Position Therapy:**
  A treatment used for patients suffering from mild OSA. Patients are advised to stay off of the back while sleeping and raise the head of the bed to reduce symptoms.

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